REMARKS/ARGUMENTS

Changes to the Specification

Serial number of patent applications referenced in the specification have in certain cases been augmented with the corresponding issued patent number.

Obviousness rejections

The Examiner rejected pending claims 1-30 under 35 U.S.C. §103 as being obvious over Vahalia (US 6,389,420) in view of Banga (US Patent Application No. 2001/0020248).
In response, applicants have amended all independent claims 1 and 19 and added four new dependent claims.

Claim 1

The Examiner has rejected claim 1 under 35 §U.S.C. 103 as being obvious over Vahalia in view of Banga (Office Action: pages 2-3). In response applicants have amended claim 1.

Pending amended independent claim 1 requires a digital data processing system with improved access to information stored on a storage device, said system comprising a plurality of first nodes and a second node coupled to one another over a communications pathway, the second node being coupled to the storage device for determining meta data including block address maps to file data in the storage device, and the first nodes being configured for accessing file data from the storage device using said meta data, wherein said system comprises:

at least one first node that caches data including meta data for a file accessed by said first node;

a file application on said first node configured to get requested file data by accessing said cached data for the file; and

a file notification system that sends a file change notification to said first node indicating changes affecting the cached data, wherein the file application on the first node inspects the change notification and based on the change notification determines, whether to get the requested file data directly using said cached data or whether to get the requested file data from the storage device, whereby file accesses may be effected for an extended time with data locally cached at first nodes of the system.

Applicants have added the requirements that based on the change notification the file application on the first node determines, whether to get the requested file data directly using said cached data or whether to get the requested file data from the storage device. The added requirements may be found in at least page 14 lines 17-19 (including blank lines) and pages 9-20 of the application.

Applicants conclude from the Examiner's acknowledgments (Office Action: Page 3, lines 11-15) of the deficiencies of the cited Vahalia, that the cited Vahalia does not teach or suggest the claims requirements of a file notification system that sends a file change notification to said first node indicating changes affecting the cached data, wherein the file application on the first node inspects the change notification and based on the change notification determines, whether to get the requested file data directly using said cached data or whether to get the requested file data from the storage device, whereby file accesses may be effected for an extended time with data locally cached at first nodes of the system.

The cited Banga (58, 59 of FIG. 5; 0025 of page 2, 0062 of page 5-6) discusses a first node (local proxy) connected to a second node (remote proxy). In the cited Banga the second node (remote proxy) sends a response to the first node (local proxy) and the first node (local proxy) receives and processes the response (27 of FIG. 2, FIG. 3, 0062 of page 5-6). However, the cited Banga does not teach or suggest the claim requirement of determining on the first node, whether to get the requested file data directly using said cached data or whether to get the requested file data from the storage device. The cited Banga teaches away from the claim

requirement of determining whether to get the requested file data directly using said cached data
or whether to get the requested file data from the storage device. In the cited Banga, the first node
on receiving the response from the second node either returns the current version of the requested
file from the cache or awaits transmission of the difference data. The transmission of the
difference data from the second node (remote proxy) to the first node (local proxy) as discussed
in the cited Banga is different from the claim requirement of the first node determining whether
to get the requested filed data from the storage device. In the cited Banga, the first node (local
proxy) just waits for getting the difference data from the second node (remote proxy). The claims
require the first node to determine whether to get the requested file data from the cached data or
from the storage device coupled to the second node. Additionally, the cited Banga discusses that
the first node waits for the difference data. However, the difference data discussed in the cited
Banga is may only be a part of requested file data of the claim requirements and not be the
requested filed data.

Therefore, neither the cited Vahalia nor the cited Banga teach or suggest the claim
requirements a file notification system that sends a file change notification to said first node
indicating changes affecting the cached data, wherein the file application on the first node
inspects the change notification and based on the change notification determines, whether to get
the requested file data directly using said cached data or whether to get the requested file data
from the storage device, whereby file accesses may be effected for an extended time with data
locally cached at first nodes of the system.

For the above reason, claim 1 is patentable over the cited art, either alone or in
combination.

Claims 2-12

The Examiner has also rejected pending claims 2-12 that depend directly or indirectly on
independent claim 1 which is patentable over the cited art for the reasons discussed above.

Page 13 of 22

Moreover, the following of these claims provide additional grounds of patentability over the cited art for the reasons discussed below.

Claim 2

Pending claim 2 depend from claim 1, and add the requirement that the file application on said first node determines whether requested file data is subject to a change notification, and if so makes a further determination whether cached data at said first node remains valid for the requested file data.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 2 are discussed.

The Examiner has cited the abstract of Vahalia in rejecting claim 2. The abstract of Vahalia discusses exchange of locks between a first node and a second node and the accessing of data based on the lock. Nowhere does the cited abstract of Vahalia teach or suggest the claim requirement of determining whether the requested file data is subject to a change notification.

Accordingly claim 2 provides additional grounds of patentability over the cited art.

Claim 3

Pending claim 3 depends from claim 1, and adds the requirement that the file application on said first node,
i) determines whether requested file data is subject to a change notification, and
ii) applies the cached meta data to directly mount the storage device to access the requested file when the cached data is not subject to a change notification.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 3 are discussed.

In the cited Vahalia (68 of FIG. 7, 70, 72 of FIG. 7) step 68 is performed if the first node has modified the metadata. The claims require the file application of the first node to determine whether requested file data is subject to a change notification and nowhere does the cited Vahalia teach or suggest the claim requirement.

Accordingly, claim 3 is patentable over the cited art.

Claim 7

Independent claim 7, depends on claim 1, wherein the file notification system runs on the second node and interfaces with a file system meta data controller to detect changes in file system storage data, issuing a file change notice in response thereto.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 7 are discussed.

The cited Vahalia (col. 22, lines 37 - col. 23, lines 42) refer to software for the first node (client of Vahalia: Vahalia col. 22, line 37) and procedure followed by the first node's operating system (col. 22, line 67). The claims require the file notification system to run on the second node and nowhere does the cited Vahalia teach or suggest the file notification system to run on the second node.

Therefore, claim 7 is patentable over the cited art.

Claim 8

Pending claim 8 depends from claim 1, wherein the file notification system limits number of change notifications for a given file to first n changes that occur, where n is a positive integer.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 8 are discussed.

The cited Vahalia (col. 15, lines 32 to col. 16 lines 41) discusses locks does not require change notifications as required by the claims. Furthermore, the cited Vahalia does not teach or suggest a numerical limit (because n is an integer in the claims) on the number of change notifications.

Therefore, claim 8 is patentable over the cited art.

Claim 9

Claim 9 depends from claim 1, wherein the file application on the first node implements a decision algorithm to determine whether to apply cached data for a requested file when the requested file is subject to a change notification.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 9 are discussed.

Nowhere does the cited Vahalia (67-72 of FIG. 7) teach or suggest that the requested file is subject to change notification as required by the claims. Block 67 of the cited Vahalia discusses whether the client has modified the metadata. This is different from the change notification as required by the claims. The cited Vahalia discusses whether the first node has changed the metadata, whereas the claims require a change notification to be examined at the first node.

Therefore claim 9 is patentable over the cited art.

Claim 11

Claim 11 depends from claim 10, wherein the file system management tasks

Page 16 of 22

performed by the second node include publication of change data.

The Examiner has mentioned that Banga discusses the invention substantially as claimed without citing any specific parts of Banga. Applicants request the Examiner to cite where in Banga the requirements of claim 11 are discussed.

The cited Vahalia (col. 9, lines 49-58) discusses granting locks and comparison of metadata version numbers . Nowhere, does the cited Vahalia teach or suggest the file system management tasks performed by the second node include publication of change data.

Therefore claim 11 is patentable over the cited art.

Claims 13, 15-17, 18-24, and 26

The Examiner has rejected claims 13, 15-17, 18-24 and 26 based on the analysis of claim 1-7, and 9-12 and Applicant traverses the rejections based on the above arguments for claims 1-7 and 9-12. Moreover, the following of these claims provide additional grounds of patentability over the cited art for the reasons discussed below.

Claim 13

The Examiner has rejected claim 13 under 35 §U.S.C. 103 as being obvious over Vahalia in view of Banga. Applicants traverse.

Pending independent claim 13 is a digital data processing system, comprising a first node and a second node coupled for communication:

a storage device coupled for communication with at least the first node; and

a cache memory coupled to and associated with the first node, the cache memory storing administrative data pertaining to files on the storage device,

the second node notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data.

Page 17 of 22

Neither the cited Vahalia nor the cited Banga teach or suggest the claim requirement of the second node notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data.

It can be concluded from the Examiner's acknowledgments (Office Action : Page 3, lines 11-15) that the cited Vahalia does not discuss the claim requirement of the second node notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data.

Nowhere does the cited Banga discuss the claim requirement of the second node notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data. The cited Banga (58, 59 of FIG. 5; 0025 of page 2, 0062 of page 5-6) discusses a first node (local proxy) connected to a second node (remote proxy). In the cited Banga the second node (remote proxy) sends a response to the first node (local proxy) and the first node (local proxy) receives and processes the response (27 of FIG. 2, FIG. 3, 0062 of page 5-6). However, the cited Banga does not teach or suggest the claim requirement of notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data. Banga discusses sending a "mime" multi-part message from the second node to the first node which is different from the claim requirements of the changes to administrative data pertaining to files. Banga discusses that the first node determines whether or not the first part of the multi-part message from the second node identifies the transmitted data from the first node as a stale version of the requested page (0062 of the cited Banga). However, the claims require the second node notifying the first node of changes to administrative data pertaining files for which the cache memory stores administrative data. Therefore, the multi-part message of the cited Banga is different from the administrative data of the claim requirements.

Therefore claim 13 is patentable over the cited art, either alone or in combination.

Claim 18

The Examiner has rejected claim 18 under 35 §U.S.C. 103 as being obvious over Vahalia in view of Banga. Applicants traverse.

Pending independent claim 18 is a method of sharing storage access in a digital data processing system having a first node and a second node coupled for communication and a storage device coupled for communication with at least the first node, such method comprising the steps of:

caching in a cache memory coupled to and associated with the first node, administrative data pertaining to files on the storage device;

communicating, to the first node, changes to administrative data pertaining to files for which the cache memory stores administrative data; and

determining, in the first node, whether to apply said cached data for accessing a file thereby reducing network communications.

Neither the cited Banga nor the cited Vahalia teach or suggest the claim requirement of caching in a cache memory coupled to and associated with the first node, administrative data pertaining to files on the storage device, and communicating, to the first node, changes to administrative data pertaining to files for which the cache memory stores administrative data and determining, in the first node, whether to apply said cached data for accessing a file thereby reducing network communications.

It can be concluded from the Examiner's acknowledgments (Office Action : Page 3, lines 11-15) that the cited Vahalia does not discuss the claim requirement of communicating, to the first node, changes to administrative data pertaining to files for which the cache memory stores administrative data and determining, in the first node, whether to apply said cached data for accessing a file.

Nowhere does the cited Banga discuss the claim requirement of communicating, to the first node, changes to administrative data pertaining to files for which the cache memory stores

administrative data and determining, in the first node, whether to apply said cached data for
accessing a file. The cited Banga (58, 59 of FIG. 5; 0025 of page 2, 0062 of page 5-6) discusses a
first node (local proxy) connected to a second node (remote proxy). In the cited Banga the second
node (remote proxy) sends a response to the first node (local proxy) and the first node (local
proxy) receives and processes the response (27 of FIG. 2, FIG. 3, 0062 of page 5-6). However,
the cited Banga does not teach or suggest the claim requirement of communicating, to the first
node, changes to administrative data pertaining to files for which the cache memory stores
administrative data and determining, in the first node, whether to apply said cached data for
accessing a file. Banga discusses sending a "mime" multi-part message from the second node to
the first node which is different from the claim requirements of the changes to administrative
data pertaining to files. Banga discusses that the first node determines whether or not the first
part of the multi-part message from the second node identifies the transmitted data from the first
node as a stale version of the requested page (0062 of the cited Banga). However, the claims
require that the second node to send administrative data pertaining to files whose administrative
data is stored in the cache of the first node. Therefore, the multi-part message of the cited Banga
is different from the administrative data of the claim requirements.

    For the above reason, claim 18 is patentable over the cited art.

Claim 19

    The Examiner has rejected 1 under 35 §U.S.C. 103 as being obvious over Vahalia in
view of Banga (Office Action: pages 2-3). In response applicants have amended claim 19.

    Amended independent claim 19 is a digital data processing method for improved access
to information stored on a storage device, wherein the system includes a storage device, a
plurality of first nodes and a second node communicating over a communications pathway, the
second node being coupled to the storage device for determining meta data for accessing file data

in the storage device, and the first nodes being configured for accessing file data from the storage
device using said meta data, wherein said method is characterized by the steps of:

caching meta data for a file accessed by said first node in a cache memory of said first
node;

providing a file application on said first node configured to get requested file data
utilizing said cached data;

storing file change notifications at said first node indicating changes that may affect the
cached data; and

determining, based on said change notifications, whether said file application may utilize
the cached data for a requested file or whether said file application accesses the requested file
from the storage device.

Applicants have added the requirements that the based on said change notifications the
file application may utilize the cached data for a requested file or whether said file application
accesses the requested file from the storage device. The added requirements may be found in at
least page 14 lines 17-19 (including blank lines) and pages 9-20 of the application.

The Examiner has rejected claim 19 based on the analysis of claim 1-7, and 9-12.
Applicant maintains the patentability of amended claim 19 based on the arguments in support of
amended claim 1, and claims 6-7, 9-12.

For the above reasons claim 19 is patentable over the cited art, either alone or in
combination.

Claim 25

Examiner appears not to have indicated specifically why claim 25 has been rejected.

Page 21 of 22

Amdt. dated May 29, 2003   Serial No. 09/687,668
Reply to Office action of 08/07/2003   Docket No. SJO920000156US1
                                                                        Firm No. 0037.0041

Claims 31-34

    The requirements for newly added claims 31-34 may be found in at least page 14 lines 17-19 (including blank lines) and pages 9-20 of the application.

Conclusion

    For all the above reasons, Applicant submits that the pending claims 1-34 are patentable over the art of record. Applicants has added four new claims and indicated fees to be charged. Nonetheless, should any additional fees be required, please charge Deposit Account No. 50-0585.

    The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

Dated: May 29, 2003   By: _____

                                                Rabindranath Dutta
                                                Registration No. 51,010

Please direct all correspondences to:

David Victor
Konrad Raynes Victor & Mann, LLP
315 South Beverly Drive, Ste. 210
Beverly Hills, CA 90212
Tel: 310-553-7977
Fax: 310-556-7984